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EXAMINER	
VICARY, KEITH E	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/551,891	VORBACH, MARTIN	
	Examiner	Art Unit	
	KEITH VICARY	2183	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 October 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *5-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *5-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :6/30/2010, 7/23/2010, 8/24/2010, 9/14/2010, 10/25/2010.

DETAILED ACTION

1. Claims 5-13 are pending in this office action and presented for examination. Claims 12-13 have been newly added by amendment filed 10/5/2010.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 12 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

4. Claim 12 recites the limitation “a program instruction is executed using a plurality of the configurations" in lines 1-2. However, the original disclosure does not appear to disclose this limitation. For example, page 1, line 32 to page 2, line 1 of the specification dated 4/18/2007 only appears to disclose of generating a configuration for each combination of reconfigurable instructions. Examiner recommends that applicant specifically point out where and how in the original disclosure this limitation is supported in the event that Applicant disagrees with the rejection.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 8-9 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Allen et al. (Allen) (US 7000161).

7. Consider claim 8, Allen discloses processing in accordance with a configuration (col. 5, line 38, user application configuration) having a maximum allowed runtime (col. 5, line 37, watchdog timer; the watchdog timer holds the maximum allowed runtime); triggering an increase, by the configuration, of the configuration's maximum allowed runtime (col. 5, lines 37-39, the watchdog timer should run continually, and the user application configuration should repeatedly signal the watchdog timer; repeatedly signaling the watchdog timer resets the timer such that the configuration can continue to execute, as signaling the watchdog timer indicates that no error or failure of col. 5, lines 40-41 or hanging of col. 5, lines 27-28, occurs); and responsive to an interrupt, suppressing an increase by the configuration of the maximum allowed runtime (col. 5, line 40-42, for example, a later-occurring error or failure that is not detected by the configuration itself can be detected by the watchdog timer; the error or failure interrupts the execution of the configuration; in response to this interrupt, no signalling occurs, and

the increase in maximum allowed runtime is suppressed) to respond to the interrupt upon expiry of the maximum allowed runtime (col. 5, lines 27-29, if it does not receive such a signal, the watchdog timer sets an exception state and initiates reconfiguration of the system).

8. Consider claim 9, Allen discloses increasing, by a configuration (col. 5, line 38, user application configuration) having a maximum allowed runtime (col. 5, line 37, watchdog timer; the watchdog timer holds the maximum allowed runtime), the configuration's maximum allowed runtime (col. 5, lines 37-39, the watchdog timer should run continually, and the user application configuration should repeatedly signal the watchdog timer; repeatedly signaling the watchdog timer resets the timer such that the configuration can continue to execute, as signaling the watchdog timer indicates that no error or failure of col. 5, lines 40-41 or hanging of col. 5, lines 27-28, occurs); and suppressing the increase in response to the interrupt (col. 5, line 40-42, for example, a later-occurring error or failure that is not detected by the configuration itself can be detected by the watchdog timer; the error or failure interrupts the execution of the configuration; in response to this interrupt, no signalling occurs, and the increase in maximum allowed runtime is suppressed); and reconfiguring the reconfigurable unit with a new reconfiguration for handling the interrupt responsive to expiry of the maximum allowed runtime (col. 5, lines 27-29, if it does not receive such a signal, the watchdog timer sets an exception state and initiates reconfiguration of the system).

9. Consider claim 11, Allen discloses configurable cells configurable with a configuration (col. 5, line 38, user application configuration) having a maximum allowed runtime (col. 5, line 37, watchdog timer; the watchdog timer holds the maximum allowed runtime), wherein the configuration is adapted to trigger a counter reset to increase its maximum allowed runtime (col. 5, lines 37-39, the watchdog timer should run continually, and the user application configuration should repeatedly signal the watchdog timer; repeatedly signaling the watchdog timer resets the timer such that the configuration can continue to execute, as signaling the watchdog timer indicates that no error or failure of col. 5, lines 40-41 or hanging of col. 5, lines 27-28, occurs) conditional at least upon that an interrupt is not detected and processing is to continue without a thread switch and without a task switch (col. 5, lines 37-39, the watchdog timer should run continually, and the user application configuration should repeatedly signal the watchdog timer; repeatedly signaling the watchdog timer resets the timer such that the configuration can continue to execute, as signaling the watchdog timer indicates that no error or failure of col. 5, lines 40-41 or hanging of col. 5, lines 27-28, occurs; thread switches and task switches do not occur in this context).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 5, 10, and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. (Smith) (US 6658564) in view of Allen et al. (Allen) (US 7000161) in view of Borkenhagen et al. (Borkenhagen) (US 6076157).

12. Consider claim 5, Smith discloses processing in accordance with a first configuration (e.g. col. 11, lines 61-62, compiling hardware functions into configuration patterns; col. 2, lines 29-31 disclose of configuration data being used to execute an application).

However, Smith does not disclose of the first configuration having a maximum allowed runtime; increasing, by the first configuration, the first configuration's maximum allowed runtime; if an interrupt occurs, suppressing the increase in response to the interrupt; and if no interrupt occurs, reconfiguring the reconfigurable unit with a second configuration in response to expiry of the increased maximum allowed runtime, the increased maximum allowed runtime expiring due to suppression by at least one of a task switch and a thread switch of a further increase of the maximum allowed runtime.

On the other hand, Allen discloses of a first configuration (col. 5, line 38, user application configuration) having a maximum allowed runtime (col. 5, line 37, watchdog timer; the watchdog timer holds the maximum allowed runtime); increasing, by the first configuration, the first configuration's maximum allowed runtime (col. 5, lines 37-39, the watchdog timer should run continually, and the user application configuration should repeatedly signal the watchdog timer; repeatedly signaling the watchdog timer resets the timer such that the configuration can continue to execute, as signaling the watchdog timer indicates that no error or failure of col. 5, lines 40-41 or hanging of col. 5, lines 27-

28, occurs); if an interrupt occurs, suppressing the increase in response to the interrupt (col. 5, line 40-42, for example, a later-occurring error or failure that is not detected by the configuration itself can be detected by the watchdog timer; the error or failure interrupts the execution of the configuration; in response to this interrupt, no signalling occurs, and the increase in maximum allowed runtime is suppressed); and reconfiguring the reconfigurable unit with a second configuration in response to expiry of the increased maximum allowed runtime (col. 5, lines 27-29, if it does not receive such a signal e.g. because the system hangs, the watchdog timer sets an exception state and initiates reconfiguration of the system), the increased maximum allowed runtime expiring due to suppression by an error, failure, or hanging of a further increase of the maximum allowed runtime (error or failure of col. 5, lines 40-41 or hanging of col. 5, lines 27-28 prevents the watchdog timer from being signaled, as described in col. 5, lines 27-29, if it does not receive such a signal e.g. because the system hangs, the watchdog timer sets an exception state and initiates reconfiguration of the system).

Allen's teaching detects errors, failures, and hanging (Allen, col. 5, lines 40-41 and col. 5, lines 27-28).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teaching of Allen with the invention of Smith in order to detect errors, failures, and hanging.

However, Smith and Allen do not disclose of at least one of a task switch and a thread switch in particular, and not an interrupt, suppressing a further increase of the maximum allowed runtime.

On the other hand, Borkenhagen discloses of at least one of a task switch and a thread switch, and not an interrupt, prohibiting further execution of a thread (col. 15, lines 36-42, forcing a thread switch).

Borkenhagen's teaching prevents system hangs due to shared resource, contention, enforces fairness of processor cycle allocation between threads, and limits the maximum response latency to external interrupt and other events external to the processor (Borkenhagen, col. 15, lines 36-42).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teaching of Borkenhagen with the invention of Smith and Allen in order to prevents system hangs due to shared resource, contention, enforces fairness of processor cycle allocation between threads, and limits the maximum response latency to external interrupt and other events external to the processor. Note that Borkenhagen's teaching of at least one of a task switch and a thread switch prohibiting further execution of a thread, when applied to the combination of Smith and Allen wherein further execution of a configuration is prohibited in response to expiry of the increased maximum allowed runtime due to suppression of a further increase of the maximum allowed runtime, teach the overall limitation of at least one of a task switch and a thread switch suppressing a further increase of the maximum allowed runtime.

13. Consider claim 10, Smith discloses processing in accordance with a first configuration (e.g. col. 11, lines 61-62, compiling hardware functions into configuration

patterns; col. 2, lines 29-31 disclose of configuration data being used to execute an application).

However, Smith does not disclose of the first configuration having a maximum allowed runtime; and if an interrupt does not occur: the first configuration triggering a counter reset, the counter reset increasing the maximum allowed runtime; subsequent to the counter reset, and for a scheduled task switch, the counter counting to the increased maximum allowed runtime without a retriggering of the counter by the first configuration; and responsive to the reaching of the increased maximum allowed runtime, performing one of a task switch and a thread switch by reconfiguring the reconfigurable unit with a second configuration; wherein, if an interrupt does occur, responsive to the occurrence of the interrupt, the maximum allowed runtime is not increased.

On the other hand, Allen discloses of a first configuration (col. 5, line 38, user application configuration) having a maximum allowed runtime (col. 5, line 37, watchdog timer; the watchdog timer holds the maximum allowed runtime); the first configuration triggering a counter reset (col. 5, lines 37-39, the watchdog timer should run continually, and the user application configuration should repeatedly signal the watchdog timer; repeatedly signaling the watchdog timer resets the timer such that the configuration can continue to execute, as signaling the watchdog timer indicates that no error or failure of col. 5, lines 40-41 or hanging of col. 5, lines 27-28, occurs), the counter reset increasing the maximum allowed runtime (col. 5, line 37, watchdog timer; the watchdog timer holds the maximum allowed runtime); subsequent to the counter reset, the counter counting to

the increased maximum allowed runtime without a retriggering of the counter by the first configuration (col. 5, line 40-42, for example, a later-occurring error or failure that is not detected by the configuration itself can be detected by the watchdog timer; the error or failure interrupts the execution of the configuration; in response to this interrupt, no signalling occurs, and the increase in maximum allowed runtime is suppressed); and responsive to the reaching of the increased maximum allowed runtime, reconfiguring the reconfigurable unit with a second configuration (col. 5, lines 27-29, if it does not receive such a signal e.g. because the system hangs, the watchdog timer sets an exception state and initiates reconfiguration of the system); wherein, if an interrupt does occur, responsive to the occurrence of the interrupt, the maximum allowed runtime is not increased (col. 5, line 40-42, for example, a later-occurring error or failure that is not detected by the configuration itself can be detected by the watchdog timer; the error or failure interrupts the execution of the configuration; in response to this interrupt, no signalling occurs, and the increase in maximum allowed runtime is suppressed).

Allen's teaching detects errors, failures, and hanging (Allen, col. 5, lines 40-41 and col. 5, lines 27-28).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teaching of Allen with the invention of Smith in order to detect errors, failures, and hanging.

However, Smith and Allen do not disclose that for a scheduled task switch, and not an interrupt, the counter counting to the increased maximum allowed runtime without a retriggering of the counter by the first configuration, and that at least one of a

task switch and a thread switch in particular, and not an interrupt, is performed by reconfiguring the reconfigurable unit with a second configuration.

On the other hand, Borkenhagen discloses of at least one of a task switch and a thread switch, and not an interrupt, prohibiting further execution of a thread (col. 15, lines 36-42, forcing a thread switch).

Borkenhagen's teaching prevents system hangs due to shared resource, contention, enforces fairness of processor cycle allocation between threads, and limits the maximum response latency to external interrupt and other events external to the processor (Borkenhagen, col. 15, lines 36-42).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teaching of Borkenhagen with the invention of Smith and Allen in order to prevents system hangs due to shared resource, contention, enforces fairness of processor cycle allocation between threads, and limits the maximum response latency to external interrupt and other events external to the processor. Note that Borkenhagen's teaching of at least one of a task switch and a thread switch prohibiting further execution of a thread, when applied to the combination of Smith and Allen wherein further execution of a configuration is prohibited in response to expiry of the increased maximum allowed runtime due to suppression of a further increase of the maximum allowed runtime, teach the overall limitation that for a scheduled task switch, the counter counting to the increased maximum allowed runtime without a retriggering of the counter by the first configuration, and that at least one of a

task switch and a thread, is performed by reconfiguring the reconfigurable unit with a second configuration.

14. Consider claim 12, Smith discloses a program instruction is executed using a plurality of the configurations, including the first configuration (col. 13, lines 28-29, plurality of blocks of configuration data that make up a given function).

15. Consider claim 13, Smith discloses a plurality of program instructions are executable via a single instance of the first configuration (col. 13, lines 33-34, a single block of configuration data that makes up a given function).

16. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smith, Allen, and Borkenhagen as applied to claim 5 above, and further in view of Parhami (Parallel Counters for Signed Binary Signals).

17. Consider claim 6, Smith, Allen, and Borkenhagen do not disclose that the first configuration triggers a parallel counter to perform the increasing.

On the other hand, Parhami discloses of a parallel counter (section 1, second paragraph, first line, parallel counter).

Parhami's teaching of a parallel counter achieves higher speeds than regular counters (section 1, first paragraph, last two lines).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teaching of Parhami with the invention of Smith, Allen, and Borkenhagen, in order to achieve higher speeds.

18. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smith, Allen, and Borkenhagen as applied to claim 5 above, and further in view of Rubinstein et al. (Rubinstein) (US 4959781).

19. Consider claim 7, Smith discloses of an interrupt whose processing requires handling within the maximum allowed runtime (col. 8, lines 14-15, detecting a high priority function such as a real-time interrupt handling process).

However, Smith, Allen, and Borkenhagen do not disclose that the interrupt whose processing requires handling within the maximum allowed runtime is handled on a component reserved for handling of interrupts whose processing requires handling within the maximum allowed runtime and on which the first configuration is not run.

On the other hand, Rubinstein discloses of handling interrupts on a component reserved for handling of interrupts on which the configuration is not run (col. 1, lines 24-29, all interrupts from a particular class are assigned to and handled by a particular processor; classes may all be assigned to a single processor).

Rubinstein's teaching minimizes impact on other system processing (Rubinstein, col. 1, lines 42-44).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teaching of Rubinstein with the invention of Smith, Allen, and Borkenhagen in order to minimize impact on other system processing.

Response to Arguments

20. Examiner has responded to the entirety of applicant arguments below, and continues to believe that the previous rejection would teach the claimed limitations. However, some of the arguments and response to arguments may not be applicable to the new grounds of rejection, which has been made to convey the examiner's best possible rejection for appeal purposes.

21. Applicant argues on page 5 that Smith's teaching of a configuration and of a thread would not suggest applying Borkenhagen's teaching of a maximum runtime to a configuration; this argument is addressed below.

22. Applicant argues on page 5 that, thus, there is no one-to-one correspondence of a thread to a configuration, and the reference to a forced thread switch after some time in the Borkenhagen reference in no way suggests a forced configuration switch after some time.

However, Smith discloses that a function can be executed either in software or hardware (e.g. col. 7, lines 7-8). Functions executed in software are compiled into threads, and functions executed in hardware are compiled into configurations (e.g. col.

11, lines 59-63). Thus, there is a correspondence between the threads and configurations: each performs the function, albeit one in software and one in hardware. It would be readily recognized to one of ordinary skill in the art at the time of the invention that the motivation of Borkenhagen is applicable and beneficial regardless of whether functions are executed in software or hardware.

Examiner notes that Smith discloses that a typical scheduling system for a reconfigurable computer may use a time-multiplexing system in which programmable logic resources may be allocated to application functions and which may involve switching between different functions at predetermined time periods (col. 8, line 66 through col. 9, line 4). Therefore, applicant's contention that one of ordinary skill in the art would only apply multitasking teachings to threads and not to configurations is inaccurate at least because Smith already does so, though as examiner has pointed out, the correlation between the threads and configurations would be enough to motivate the combination. Nevertheless, it is Borkenhagen's multitasking policy in particular which examiner is applying to Smith. Again, given that Smith not only correlates threads to configurations but also teaches of applying the multitasking aspect of threads to configurations, one of ordinary skill in the art at the time of the invention would recognize that Borkenhagen's specific multitasking policy would not only be applicable to threads but also to configurations, given that the goal of the policy to prevent processor hangs is applicable regardless of whether the program which is hanging is being executed in software or hardware. The execution of functions in hardware (e.g. to provide faster execution times as per Smith, col. 1, lines 46-47) does

not nullify the benefit of Borkenhagen's teaching. It would be readily recognized that an explicit recitation that any general modification that one can do to threads, one can likewise do to configurations, is not necessary for the aforementioned combination to nevertheless be proper.

23. Applicant argues on page 5 that at column 8, line 66 to column 9, line 4, the Smith reference merely suggests applying a time-multiplexing system to functions, and that nowhere does the Smith reference suggest applying a time-multiplexing system to configurations.

However, Smith discloses in numerous places discloses of the correlation between functions and configurations. For example, col. 11, lines 60-63 discloses of compiling hardware functions into configuration patterns using a hardware description language compiler, and col. 9, lines 7-11 discloses of function prefetching wherein the programmable logic resource can be loaded with the configuration data before the function is required. In other words, the invention of Smith entails functions which correlate to configuration data. As another example, col. 13, lines 31-33, discloses of a single block of configuration data making up a given function. Therefore, any extent by which Smith suggests applying a time-multiplexing system to functions would likewise apply to configuration data, as functions which are time-multiplexed and implemented via configurations consequently entails the configurations being time-multiplexed.

24. Applicant argues on pages 5-6 that while the Smith reference may provide certain configurations of hardware that provide for operation in a manner that corresponds in its entirety to a function as a whole, the time-multiplexing is ultimately provided on a function-by-function basis, and not a configuration-by-configuration basis. Applicant provides as an example, if a configuration is usable for multiple functions, then, while the time-multiplexing may provide for interrupting a particular function, the configuration may continue to be used without reconfiguration.

However, examiner notes that the instant disclosure does not disclose of a configuration usable for multiple functions or its corresponding operation, and thus it is not necessarily the case in the hypothetical scenario that the configuration may continue to be used without reconfiguration: it could also be the case that reconfiguration occurs (e.g. because the system does not know configurations used for multiple functions are the same, or because reloading is necessary to reinitialize the configuration for use by another function, or so forth). Moreover, it is not necessarily the case that a configuration usable for multiple functions (i.e. two different functions which use the same configuration) would even be covered by Smith. In contrast, Smith discloses of time-multiplexing functions implemented via corresponding configurations (and thus discloses of time-multiplexing configurations), which supports the modification by Borkenhagen of a specific multitasking policy to configurations in particular.

In addition, examiner generally notes that the instant disclosure does not appear to explicitly disclose of the behavior that applicant argues contrasts with Smith, as page 7, lines 6-7 only discloses that the maximum execution time of a CIW has an upper limit.

There is no disclosure of "different functions" using a CIW such that a CIW is executed consecutively to carry out the different functions, for example.

25. Applicant points out on page 6 that the Smith reference states that different functions have predetermined time intervals.

However, col. 9, line 3 discloses of "switching between different functions at predetermined time intervals." Therefore, Smith does not explicitly state that different functions have predetermined time intervals. Examiner notes that it is unclear as to applicant's intent in referencing col. 9, line 3, as paraphrased or otherwise. To the extent that applicant is merely stressing Smith's teaching of "predetermined" time intervals to contrast with the claimed concept of increasing a first configuration's maximum allowed runtime, Borkenhagen nevertheless teaches and motivates this concept.

26. Applicant argues on page 6 that Smith does not refer to increasing such predetermined time intervals, much less increasing by a first configuration.

However, examiner is relying upon Borkenhagen to teach and motivate this concept.

27. Applicant argues on page 6 that since Smith does not disclose increasing a maximum allowed runtime, the Smith reference also does not disclose suppressing such an increase.

However, as explained in the rejection, the implementation of switching between functions at predetermined time intervals keeps a function from executing for longer than its predetermined time length. Consequently, the switching between functions suppresses an increase of the maximum allowed runtime. Regardless, examiner notes that Borkenhagen discloses of only forcing a thread switch if another thread is ready to process instructions; and thus Borkenhagen discloses of a maximum allowed runtime expiring due to suppression by at least one of a task switch and a thread switch of an increase of the maximum allowed runtime. Examiner generally notes that a broad interpretation of the limitation enables the suppressing of an increase to be taught by Smith even if the increase itself is not, as long as no increase occurs.

28. Applicant argues on page 6 that the Borkenhagen reference merely describes a waiting period during which the thread switch controller 450 waits until another thread is ready to execute instructions, which does not constitute increasing a maximum allowed runtime (citing col. 15, lines 7-10).

However, Borkenhagen (e.g. in col. 15, lines 1-19) does not disclose of halting execution for a thread, but not switching threads, until another thread is ready to execution instructions. Consequently, the executing thread continues executing rather than being replace by another thread due to a thread switch, and the executing thread is subject to an increased maximum allowed runtime.

29. Applicant argues on page 6 that once another thread is ready to execute, a switch would occur according to the Borkenhagen reference, without waiting for a maximum allowed runtime to expire. Applicant argues that this teaching of Borkenhagen is in contrast to claim 5 which recites "reconfiguring the reconfigurable unit with a second configuration in response to expiry of the increased maximum allowed runtime."

However, examiner first notes that while it may be the case in Borkenhagen that "once another thread is ready to execute, a switch would occur," in the circumstance where a thread continues to execute because no other thread is ready to be executed, this does not stop Borkenhagen from also teaching the concept of a thread switch in response to expiry of the increased maximum allowed runtime (e.g. when the decrement register is zero and another thread is ready to execute).

30. Applicant argues on page 6 that no first configuration of the Borkenhagen reference causes an increase of a first configuration's maximum allowed runtime, as it is the thread switch controller 450 of the Borkenhagen reference that controls the timing of a thread switch.

However, Borkenhagen in col. 15, lines 5-6, discloses of sending a signal to the thread switch controller which forces a thread switch unless no other thread is ready to process instructions. This signal is "by a thread" (e.g. col. 15, lines 20-22, the thread switch time-out register can be written by the processor itself with software code; the thread switch time-out register determines when the signal is sent as explained in col.

15, lines 1-7). Alternatively, the above increase would only occur if the first thread had not been previously switched from prior to reaching the first thread's maximum allowed runtime. Borkenhagen, col. 13, lines 47-67 discloses that a thread can switch in the event of various cache misses for the thread; consequently, the first thread causes the increase in the first thread's maximum allowed runtime by not containing instructions which would trigger the various cache misses prior to reaching the first thread's maximum allowed runtime. Alternatively, the thread only runs past the maximum allowed runtime if there are instructions left in the thread to execute; otherwise, the thread is not being run. In other words, a thread's increase in the maximum allowed time it can run is put into effect by the thread not being complete and having instructions remaining that it can execute. Therefore, Smith as modified by Borkenhagen does disclose the features of increasing, by the first configuration, the first configuration's maximum allowed runtime, and if an interrupt occurs, suppressing the increase in response to the interrupt.

31. Applicant argues on page 7 that the Jones reference does not disclose or suggest the feature of increasing, by the first configuration, the first configuration's maximum allowed runtime, and if an interrupt occurs, suppressing the increase in response to the interrupt.

However, the examiner has relied upon Jones as applied to Smith and Borkenhagen to teach the claimed limitation. As noted in the rejection, Jones' teaching of threads for performing device interrupt handling, when implemented into the invention

of Smith and Borkenhagen wherein the existence of other functions ready to process instructions suppresses an increase in maximum allowed runtime, results in the overall limitation of, when an interrupt occurs, suppressing the increase in response to the interrupt.

Conclusion

32. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEITH VICARY whose telephone number is (571)270-1314. The examiner can normally be reached on Monday - Thursday, 7:00 a.m. - 5:30 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on 571-272-4162. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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